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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,934	05/15/2001	Sung-Joo Kim	Q63985	7945

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EXAMINER

TABATABAI, ABOLFAZL

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/854,934

Applicant(s)

SUNG-JOO KIM

Examiner

Abolfazl Tabatabai

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6 and 7 is/are rejected.
- 7) ☐ Claim(s) 3 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### **Claim Rejections - 35 USC § 103**

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda et al (U S 6,584,155 B2) in view of lu (5,471,252).

Regarding claim 1, Takeda discloses a system for estimating motion estimation vector comprising the steps of:

(a) inputting a frame in units of macro blocks and a search area and estimating candidate motion vectors for a macro block desired to be estimated (column 4, lines 5-13 and column 9, lines 23-53).

However, Takeda is silent about the specific details regarding the step of:

(b) if an error of the candidate motion, vectors estimated in step (a) is in a threshold range, estimating motion in a restricted search area centered on the estimated location, and otherwise, estimating motion in the whole of said search area.

In the same field of endeavor, however, lu discloses a system for estimating motion vector fields by rejecting local outliers comprising the step of:

(b) if an error of the candidate motion, vectors estimated in step (a) is in a threshold range (column 3, lines 7-20), estimating motion in a restricted search area

Art Unit: 2625

centered on the estimated location (column 9, lines 23-29), and otherwise, estimating motion in the whole of said search area (column 3, lines 63-67 and column 4, lines 1-5). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use if an error is in a threshold range and estimating motion in a restricted search area centered on the estimated location as taught by lu in the system of Takeda because lu provides Takeda a system for estimating motion vector fields in a sequence of moving images. The estimation of motion vector fields is an important task in many areas of endeavor such as computer vision; motion compensated coding of moving images, image noise reduction and image frame-rate conversion. Conventional approaches to the problem of estimating motion vector fields typically require simultaneously solving equations having several thousand unknown quantities.

Regarding claim 2, Takeda discloses a system for estimating motion estimation vector wherein a zero motion vector, a median of motion vectors of neighboring macro blocks, and a value estimated from the previous or next frame are generated, and a candidate motion vector is obtained by selecting a value best matching the macro block desired to be estimated, among the three values (column 7, lines 63-67 and column 8, lines 1-46).

Regarding claim 4, Takeda is silent about the specific details regarding the threshold in step (b) is adjusted by estimating an encoding time for the current frame at each slice unit corresponding to the macro block group, based on a target encoding time calculated in advance.

Art Unit: 2625

In the same field of endeavor, however, lu discloses a system for estimating motion vector fields by rejecting local outliers comprising the step of:

the threshold in step (b) is adjusted by estimating an encoding time for the current frame at each slice unit corresponding to the macro block group, based on a target encoding time calculated in advance (column 11, lines 20-30; 52-65 and column 12, lines 1-5).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use threshold adjusted by estimating an encoding time as taught by lu in the system of Takeda because lu provides Takeda a system for estimating motion vector fields in a sequence of moving images. The estimation of motion vector fields is an important task in many areas of endeavor such as computer vision; motion compensated coding of moving images, image noise reduction and image frame-rate conversion. Conventional approaches to the problem of estimating motion vector fields typically require simultaneously solving equations having several thousand unknown quantities.

Regarding claim 7, Takeda discloses a system for estimating motion estimation vector further comprising:

a half pixel motion estimation unit for estimating half pixel motion, referring to the location of the estimated value estimated by the motion estimation unit (column 3, lines 16-33 and column 9, lines 29-39).

**Allowable Subject Matter**

3. Claims 3 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Citation of Relevant Prior Art**

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bellifemine et al (U S 6,122,320) disclose circuit for motion estimation in digitized video sequence encoder.

Zhang et al (U S 6,449,312 B1) discloses method of estimating motion in interlaced video.

Yokoyama (U S 6,058,212) discloses motion compensated inter-frame prediction method based on adaptive motion vector interpolation.

Gardyne et al (U S 5,973,742) disclose system and method for performing motion estimation with reduced memory loading latency.

Butter et al (U S 6,549,757 B1) disclose efficient, flexible motion estimation architecture for real time MPEG2 compliant encoding.

**Contact Information**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (703) 306-5917.

The examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mehta Bhavesh M, can be reached at (703) 308-5246.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai

Patent Examiner

Group Art Unit 2625

February 18, 2004

A handwritten signature in black ink, appearing to read 'Jayanti K. Patel', with a long horizontal flourish extending to the right.

Jayanti K. Patel  
Primary Examiner